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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,986	10/29/2003	Masaharu Nagai	12732-171001	5334
26171	7590	10/03/2006		
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EXAMINER				
CHACKO DAVIS, DABORAH				
ART UNIT		PAPER NUMBER		
1756				

DATE MAILED: 10/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/694,986

Applicant(s)

NAGAI ET AL.

Examiner

Daborah Chacko-Davis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 17, 18 and 20-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 17, 18 and 20-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>08/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 10, 2006, has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 9-11, and 20-27, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 4,646,424 (Parks et al., hereinafter referred to as Parks) in view of U. S. Patent No. 6,009,888 (Ye et al., hereinafter referred to as Ye).

Parks, in col 2, lines 59-68, in col 3, lines 1-10, in col 6, lines 3-59, a method of forming a semiconductor device by forming a gate electrode on a substrate, forming a positive resist pattern (the resist is photosensitive, contains a photosensitizer) on the gate material film (metal layer), plasma etching (dry etching) the gate material film exposed using the resist pattern as the mask, removing the remaining resist material by using a stripper (stripping the remaining resist, resist removing process) (claims 1-4).

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Parks, in col 1, lines 8-11, and in col 2, lines 59-65, discloses that the metal film is a titanium film and the titanium forms a gate electrode material in a thin film transistor (claims 9-11, and 24-27). Parks, in col 6, lines 5-7, discloses that the substrate material is glass (claims 20-23).

The difference between the claims and Parks is that Parks does not disclose irradiating the resist residuals, remaining on the pattern after the stripping process, with light. Parks does not disclose that after the dry etch processes (more than one dry etch process) the resist pattern is irradiated with light.

Ye, in the abstract, and in col 5, lines 1-67, and in col 6, lines 1-35, discloses that after the dry etching processes and resist stripping processes, an irradiation is performed on the resist pattern and/or the resist residue remaining on the pattern structure formed (metal or insulating patterns), with laser.

Therefore, it would be obvious to a skilled artisan to modify Parks by employing the method of irradiating the resist pattern after dry etch processes, and/or stripping processes as suggested by Ye because Ye, in col 4, lines 33-34, discloses that irradiating the residues remaining or photoresist pattern (remaining after dry etch processes) with laser is a synergetic effect that is superior to conventional strip processes, and Ye, in col 6, lines 25-26, discloses that laser removes all the polymers and resist remaining on the structure.

4. Claims 5-8, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 4,646,424 (Parks et al., hereinafter referred to as Parks) in view of U. S.

Patent No. 6,009,888 (Ye et al., hereinafter referred to as Ye) as applied to claims 1-4, 9-11, and 20-27 above, and further in view of U. S. Patent No. 6,645,851 (Ho et al., hereinafter referred to as Ho).

Parks in view of Ye is discussed in paragraph no. 3.

The difference between the claims and Parks in view of Ye is that Parks in view of Ye does not disclose the photosensitizer recited in claims 5-8.

Ho, in the abstract, and in col 4, lines 1-19, discloses that the photoresist composition used for forming the photoresist pattern mask is a novolac type resin that includes a photosensitizer such as diazonaphthoquinone compound.

Therefore, it would be obvious to a skilled artisan to modify Parks in view of Ye by employing the photoactive compound (photosensitizer) suggested by Ho in the photoresist composition because Ho, in col 9, lines 43-54, discloses that adding the claimed photosensitizer (DNQ) in the photoresist composition enables the use of the formed photoresist composition (novolac resin + DNQ) in wavelengths such as 300nm to about 500nm, and also aids in the lowering of the melt temperature of the formed photoresist layer below the glass transition temperature of the novolac resin.

5. Claims 17-18, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 4,646,424 (Parks et al., hereinafter referred to as Parks) in view of U. S. Patent No. 6,009,888 (Ye et al., hereinafter referred to as Ye) as applied to claims 1-4, 9-11, and 20-27 above, and further in view of U. S. Patent No. 4,816,115 (Hörner et al., hereinafter referred to as Hörner).

Parks in view of Ye is discussed in paragraph no. 3.

The difference between the claims and Parks in view of Ye is that Parks in view of Ye does not disclose the exposure period of time recited in claims 17, and 18.

Hörner, in col 5, lines 25-30, discloses that the photoresist is exposed to radiation for about 3 seconds.

Therefore, it would be obvious to a skilled artisan to modify Parks in view of Ye by employing the exposure range suggested by Hörner because Hörner, in col 5, lines 30-52, discloses that adjusting the exposure time to a desired duration enables the tailoring of the desired edge angle of the photoresist pattern formed.

Response to Arguments

6. Applicant's arguments with respect to claims 1-11, 17-18, and 20-27, filed August 10, 2006, have been considered but are moot in view of the new ground(s) of rejection. See paragraph nos. 3, 4, and 5.

Conclusion


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent

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Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd

September 26, 2006.



JOHN A. MCPHERSON
PRIMARY EXAMINER